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IDEA-0736-67
Copy 9 of 9

30 November 1967

MEMORANDUM FOR THE RECORD

SUBJECT: U-2R Static Longitudinal Stability

REFERENCE: LAC Report SP-1233, "Performance, Stability and Control of the L-351 Airplane"

1. The reference report which was very recently received in D/R&D/OSA presents data on the longitudinal stability of the U-2R as a function of Mach number and lift coefficient. The data show that, as previously indicated by LAC, the static longitudinal stability margin is 5% for a 30% c.g. position at Mach = .20. However, what had not been previously reported is that the static margin decreases with increasing Mach number to M = .65 and then begins to increase so that at the high altitude cruise condition, the margin is 3% for a 30% c.g. position. This adds further emphasis to previous cautionary statements by D/R&D/OSA that every effort must be made to keep the c.g. from moving aft beyond the 30% point.

2. A relatively insignificant drag penalty will be paid for c.g. shifts forward up to a 25% c.g. location. In fact, the estimated U-2R performance has been based on a trim condition for 25% c.g.

USAF review(s) completed.

[redacted]

25X1A

ASD/R&D/OSA

25X1A ASD/R&D/OSA [redacted] bjg (30 Nov 67)

Distribution:
#1 - D/R&D/OSA
#2 - D/M/OSA
#3 - D/O/OSA
#4 - IDEA/O/OSA
#5 - SAS/O/OSA
#6 - ASD/R&D/OSA
#7 - D/SA
#8 - ASD Chrono
#9 - RB/OSA

[redacted]

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25X1

IDEA-0735-67
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30 November 1967

MEMORANDUM FOR THE RECORD

SUBJECT: U-2R Runaway Pitch Trim

25X1A REFERENCE: D/R&D/OSA Memo [redacted] dated 21 November 1967

1. Subsequent to the U-2R technical meeting of 9 November 1967, see reference memorandum, LAC re-evaluated the runaway pitch trim forces which would result in the event of a malfunction in the pitch trim power cut-off circuit. It was concluded that, contrary to their previous assessment, intolerable stick forces could be encountered during a nose up runaway condition as well as during a nose down runaway condition. Previously it was thought that the added drag associated with the nose up condition would immediately decrease the speed of the aircraft; however, the calculations revealed that the drag force build up would not be rapid enough to prevent excessive stick forces.

2. This re-evaluation also made LAC aware of the fact that since the U-2R stabilizer trim system is electrical/hydraulic rather than just electrical as in the U-2C, the possibility exists that even though the trim power cut-off switch removed electrical power from the selector valve, this valve could conceivably stick in the open position thereby applying full hydraulic pressure to the hydraulic stabilizer trim motor. Therefore, a normally open shut-off valve is being added in series with the selector valve. This valve will close upon actuation of the trim power cut-off switch so that all hydraulic pressure is eliminated. (See attached sketch). With the addition of this valve, the actuation of the trim power cut-off switch will remove all hydraulic pressure from the stabilizer trim motor unless both valves simultaneously stuck in the open position.

3. This valve is being fabricated and will be installed when the aircraft is down for other work.

25X1A

[redacted]

ASD/ R&D/ OSA

Attachment - As noted

[redacted]

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25X1

25X1

25X1A ASD/R&D/OSA [redacted] jg (30 Nov 67)

Distribution:
#1 - D/R&D/OSA (w/att)
#2 - D/SA (w/att)
#3 - D/M/OSA (w/att)
#4 - D/O/OSA (w/att)
#5 - IDEA/O/OSA (w/att)
#6 - SAS/O/OSA (w/att)
#7 - ASD/R&D/OSA (w/att)
#8 - ASD Chrono (w/att)
#9 - RB/SA (w/o att)

25X1